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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/799,641	03/15/2004	Yuichi Atarashi	02860.0783	8026

22852 7590 10/18/2007

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EXAMINER	
BIBBINS, LATANYA	

ART UNIT	PAPER NUMBER
2627	

MAIL DATE	DELIVERY MODE
10/18/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/799,641	ATARASHI ET AL.	
	Examiner	Art Unit	
	LaTanya Bibbins	2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 July 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. In the remarks filed on July 24, 2007, Applicant amended claims 1, 4, 12, 15, 17, 20, and 21 and submitted arguments for allowability of pending claims 1-31.

Response to Arguments

2. Applicant's arguments, filed July 24, 2007, with respect to the rejections of claims 1-31 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, new grounds of rejection is made.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 3, 5, 8, 10, 15, 16, 19, 20, 22, 24, 25,26, 28, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaiho et al. (US PGPub Number 2003/0185136 A1) and further in view of Kimura et al. (US PGPub Number 2002/0012313 A1).

Regarding claim 1, Kaiho teaches an optical pickup apparatus (Figure 4) comprising: first, second and third light sources (Figure 4 elements 31, 5, and 1 respectively) emitting light fluxes having wavelengths of $\lambda 1$, $\lambda 2$ ($\lambda 1<\lambda 2$) and $\lambda 3$ ($\lambda 2<\lambda 3$) respectively (see paragraph [0046] where $\lambda 1$=405nm, $\lambda 2$=650nm, and $\lambda 3$=780nm); a

light converging optical system (see the optical system in Figures 3 and 4 composed of elements 1-8, 11, 15-17, 21, 22, 32-38, and 41) comprising an objective optical element (element 15 of Figures 3 and 4), for converging a light flux emitted from the first light source onto a first information recording surface of a first optical information recording medium through a first protective layer with a thickness of t1 so as to conduct recording or reproducing of information for the first optical information recording medium, converging a light flux emitted from the second light source onto a second information recording surface of a second optical information recording medium through a second protective layer with a thickness of t2 so as to conduct recording or reproducing of information for the second optical information recording medium, and converging a light flux emitted from the third light source onto a third information recording surface of a third optical information recording medium through a third protective layer with a thickness of t3 (t1<t3 and t2<t3) so as to conduct recording or reproducing of information for the third optical information recording medium (see paragraphs [0045] and [0046]), wherein the light converging optical system introduces the light flux emitted from the first light source as an infinite parallel light flux to be incident on the objective optical element when information is reproduced from or recorded on the first optical information recording medium (see paragraph [0069] and the condensing lenses in Figure 4 elements 35-37); and wherein the light converging optical system comprises:

a spherical aberration correcting structure to correct a spherical aberration caused by at least one of a difference in thickness among the first to third protective layers and a difference in wavelength among light fluxes from the first to third light

sources (see the wavelength selecting limiting unit in Figures 3 and 4 element 21 and the discussion in paragraphs [0053]-[0060])

Kaiho fails to teach, a chromatic aberration correcting element. Kimura, however, teaches a chromatic aberration correcting element arranged in an optical path where a light flux emitted from the first light source passes, the chromatic aberration correcting element for suppressing a variation of a chromatic aberration based on a wavelength variation in a light flux emitted from the first light source (see paragraphs [0370], [0408], and [0462]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the chromatic aberration correcting element of Kimura into the optical pickup apparatus of Kaiho. One of ordinary skill in the art at the time the invention was made would have been motivated to combine the teachings in order to correct the chromatic aberration of the converging optical system, particularly in the case where the wavelength of the light source is 500 nm or less since the chromatic aberration becomes larger (Kimura paragraph [0408]).

Regarding claim 3, Kaiho teaches a spherical aberration correcting element having the spherical aberration correcting structure in a common path where all of the light fluxes emitted from the first to third light sources pass (Figures 3 and 4 element 21 and paragraph [0046]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine spherical aberration correcting structure taught by Kimura with the optical apparatus of Kaiho. One of ordinary skill in the art at the time

the invention was made would have been motivated to combine the teachings in order to provide a means for correcting the variation of the spherical aberration (Kimura paragraph [0041]).

Regarding claim 5, Kaiho fails to teach that the objective optical element has the spherical aberration correcting structure. Kimura, however, teaches an optical pickup apparatus wherein the objective optical element has the spherical aberration correcting structure (paragraph [0041]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine spherical aberration correcting objective lens taught by Kimura with the optical apparatus of Kaiho. One of ordinary skill in the art at the time the invention was made would have been motivated to combine the teachings in order to provide a means for correcting the variation of the spherical aberration (Kimura paragraph [0041]).

Regarding claim 8, Kaiho fails to teach that the light converging optical system introduces the light flux emitted from the third light source as a finite divergent light flux to be incident on the objective optical element when information is reproduced from or recorded on the third information recording medium. Kimura, however, teaches an optical pickup apparatus wherein the light converging optical system introduces the light flux emitted from the third light source as a finite divergent light flux to be incident on the objective optical element when information is reproduced from or recorded on the third information recording medium (see the description of the beam expander in paragraphs

[0197] to [0213] which is identical to the element applicant uses to convert the light into the finite divergent light flux).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the beam expander or Kimura into the optical pickup apparatus of Kaiho. One of ordinary skill in the art at the time the invention was made would have been motivated to combine the teachings in order to "finely correct" the chromatic aberration generated by the condenser lens (see Kimura paragraphs [0201] and [0202]).

Regarding claim 10, Kaiho fails to teach that the light converging optical system introduces the light flux emitted from the second light source as a finite divergent light flux to be incident on the objective optical element when information is reproduced from or recorded on the second information recording medium. Kimura, however, teaches an optical pickup apparatus wherein the light converging optical system introduces the light flux emitted from the second light source as a finite divergent light flux to be incident on the objective optical element when information is reproduced from or recorded on the second information recording medium (see the description of the beam expander in paragraphs [0197] to [0213] which is identical to the element applicant uses to convert the light into the finite divergent light flux).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the beam expander or Kimura into the optical pickup apparatus of Kaiho. One of ordinary skill in the art at the time the invention was made would have been motivated to combine the teachings in order to

"finely correct" the chromatic aberration generated by the condenser lens (see Kimura paragraphs [0201] and [0202]).

Regarding claim 15, Kaiho fails to teach that the chromatic aberration correcting element is at least one of a beam expander, a collimator, or a coupling lens. Kimura, however, teaches an optical pickup apparatus, wherein the chromatic aberration correcting element is at least one of a beam expander, a collimator, or a coupling lens (see paragraph [0200] where the chromatic aberration is corrected with a beam expander).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the beam expander or Kimura into the optical pickup apparatus of Kaiho. One of ordinary skill in the art at the time the invention was made would have been motivated to combine the teachings in order to "finely correct" the chromatic aberration generated by the condenser lens (see Kimura paragraphs [0201] and [0202]).

Regarding claim 16, Kimura teaches an optical pickup apparatus, wherein the chromatic aberration correcting element is a beam expander (see paragraph [0200]).

Regarding claim 19, Kaiho fails to teach that at least a part of the spherical aberration correcting element is movable along an optical axis. Kimura, however, teaches an optical pickup apparatus wherein at least a part of the spherical aberration correcting element is movable along an optical axis (paragraph [0217]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine spherical aberration correcting element taught

by Kimura with the optical apparatus of Kaiho. One of ordinary skill in the art at the time the invention was made would have been motivated to combine the teachings in order to produce an optical apparatus where "a tolerance in manufacture of an optical element that forms a converging optical system can be made large, and thereby, productivity can be enhanced" (Kimura paragraph [0217]).

Regarding claim 20, Kaiho fails to teach that the spherical aberration correcting element is at least one of a beam expander, a collimator, or a coupling lens. Kimura, however, teaches an optical pickup apparatus wherein the spherical aberration correcting element is at least one of a beam expander, a collimator and a coupling lens (paragraph [0517]).

Regarding claim 22, Kaiho fails to teach that the spherical aberration correcting element is a beam expander. Kimura, however, teaches an optical pickup apparatus wherein the spherical aberration correcting element is a beam expander (paragraph [0517]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the beam expander or Kimura into the optical pickup apparatus of Kaiho. One of ordinary skill in the art at the time the invention was made would have been motivated to combine the teachings in order to finely correct the spherical aberration.

Regarding claim 24, Kaiho fails to teach that the spherical aberration correcting element is a liquid crystal element. Kimura, however, teaches an optical pickup

apparatus wherein the spherical aberration correcting element is a liquid crystal element. (paragraph [0405] and [0406]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the liquid crystal element of Kimura into the optical pickup apparatus of Kaiho. One of ordinary skill in the art at the time the invention was made would have been motivated to combine the teachings in order to produce an optical system that has a structure that is mechanically simple (Kimura paragraph [0407]).

Regarding claim 25, Kaiho fails to teach that the spherical aberration correcting element corrects a spherical aberration caused by temperature variation in the objective optical element. Kimura, however, teaches an optical pickup apparatus, wherein the spherical aberration correcting element corrects a spherical aberration caused by temperature variation in the objective optical element (see paragraph [0046]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to correct the spherical aberration caused by temperature variation, as taught by Kimura, in the optical pickup apparatus of Kaiho. One of ordinary skill in the art at the time the invention was made would have been motivated to combine the teachings in order to effectively suppress the variation of the spherical aberration of the objective lens caused due to the temperature or humidity change of the environment in which the optical pick-up apparatus is use (see Kimura paragraph [0046]).

Regarding claim 26, Kimura teaches wherein the objective optical element is made of a plastic material (see paragraphs [0370], [0408], and [0436]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the plastic objective lens taught by Kimura into the optical pickup apparatus of Kaiho. One of ordinary skill in the art at the time the invention was made would have been motivated to combine the teachings in order to reduce the weight of the optical system (Kimura paragraph [0471]).

Regarding claim 28, Kimura teaches wherein an incidence plane of a light flux emitted from the light sources in the objective optical element is a refracting surface (see paragraph [0524]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the objective lens of Kimura in the optical pickup apparatus of Kaiho. One of ordinary skill in the art at the time the invention was made would have been motivated to combine the teachings in order to provide "correction of the spherical aberration deviation due to the difference of the transparent substrate thickness of different optical information recording media" (Kimura paragraph [0524]).

Regarding claim 31, Kaiho teaches an aperture limiting element (see the numeral aperture limiting unit in Figures 3 and 4 element 21).

5. Claims 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaiho et al. (US PGPub Number 2003/0185136 A1) in view of Kimura et al.

(US PGPub Number 2002/0012313 A1), as applied to claim 1 above, and further in view of Kim (US Patent Number 6,747,938 B2).

Regarding claim 2, Kaiho in combination with Kimura disclose the optical pickup apparatus of claim 1. Although Kaiho and Kimura teach that the thickness of t2 is 0.6 mm (see Kaiho Table 1), Kaiho and Kimura fail to teach t1 such that the thickness of t1 and t2 satisfy a following relationship: $0.9 \cdot t1 < t2 < 1.1 \cdot t1$. Kim, however, teaches an optical information recording medium wherein the thickness of t1 and t2 satisfy a following relationship: $0.9 \cdot t1 < t2 < 1.1 \cdot t1$ (see column 1 lines 59-61 where the protective layer of the HD-DVD has a a thickness of 0.6mm which satisfies the relation ship $0.9 \cdot t1 < t2 < 1.1 \cdot t1$).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the optical recording medium with a protective layer thickness of 0.6 mm as taught by Kim in the optical pickup apparatus of Kaiho and Kimura. One of ordinary skill in the art at the time the invention was made would have been motivated to combine the teachings in order to manufacture a HD-DVD in a from identical to the existent DVD but with an increased recording capacity (see Kim column 1 line 66 through column 2 line 2).

Regarding claim 4, Kaiho and Kimura in combination with Kim teach the optical pickup apparatus of claim 2. Kaiho further teaches an optical pickup apparatus comprising a spherical aberration correcting element having the spherical aberration correcting structure (see the wavelength selecting limiting unit in Figures 3 and 4 element 21 and the discussion in paragraphs [0053]-[0060]).

6. Claims 6, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaiho et al. (US PGPub Number 2003/0185136 A1) in view of Kimura et al. (US PGPub Number 2002/0012313 A1), as applied to claim 1 above, and further in view of Kitaoka et al. (US Patent Number 6819,646 B1).

Regarding claim 6, Kaiho in combination with Kimura fail to teach that the second and third light sources are attached on the same base board. Kitaoka, however, teaches an optical pickup wherein the second and third light sources are attached on the same base board (see column 13 lines 48-60).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to attach both the second and third light sources on the same base board (as taught by Kitaoka) in the optical pickup apparatus of Kaiho and Kimura. One of ordinary skill in the art at the time the invention was made would have been motivated to combine the teachings in order to produce a "small-size optical pickup that, with a simple configuration, achieves compatibility between multiple types of optical disks" (Kitaoka column 4 lines 27-29).

Regarding claim 13, Kaiho in combination with Kimura fail to teach that the light converging optical system comprises a collimator and light fluxes emitted from the first to third light sources pass through the collimator toward the objective optical element. Kitaoka, however, teaches an optical pickup wherein the light converging optical system comprises a collimator (Figure 4, element 34) and light fluxes emitted from the first to

third light sources pass through the collimator toward the objective optical element (see Figure 4 and the discussion in column 14 lines 12-14).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the collimator (as taught by Kitaoka) in the optical pickup apparatus of Kaiho and Kimura. One of ordinary skill in the art at the time the invention was made would have been motivated to combine the teachings in order to produce a "small-size optical pickup that, with a simple configuration, achieves compatibility between multiple types of optical disks" (Kitaoka column 4 lines 27-29).

Regarding claim 14, Kaiho in combination with Kimura fail to teach that the first to third light sources are arranged with the same distance from the objective optical element. Kitaoka, however, teaches an optical pickup wherein the first to third light sources are arranged with the same distance from the objective optical element (see Figure 4 and the discussion in column 13 lines 48-60 where the three light sources are mounted on the same submount and thus all three light sources are the same distance from the objective lens).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to arrange first to third light sources equidistance from the objective lens (as taught by Kitaoka) in the optical pickup apparatus of Kaiho and Kimura. One of ordinary skill in the art at the time the invention was made would have been motivated to combine the teachings in order to produce a "small-size optical pickup that, with a simple configuration, achieves compatibility between multiple types of optical disks" (Kitaoka column 4 lines 27-29).

7. Claims 7, 9, 11, 12, 17, 18, 21, 23, 27, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaiho et al. (US PGPub Number 2003/0185136 A1), Kimura et al. (US PGPub Number 2002/0012313 A1), and Kim (US Patent Number 6,747,938 B2) as applied to claim 4 above, and further in view of Kitaoka et al. (US Patent Number 6819,646 B1).

Regarding claim 7, Kaiho, Kimura, and Kim fail to teach that the second and third light sources are attached on the same base board. Kitaoka, however, teaches an optical pickup wherein the second and third light sources are attached on the same base board (see column 13 lines48-60).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to attach both the second and third light sources on the same base board (as taught by Kitaoka) in the optical pickup apparatus of Kaiho, Kimura, and Kim. One of ordinary skill in the art at the time the invention was made would have been motivated to combine the teachings in order to produce a "small-size optical pickup that, with a simple configuration, achieves compatibility between multiple types of optical disks" (Kitaoka column 4 lines 27-29).

Regarding claim 9, Kimura teaches an optical pickup apparatus wherein the light converging optical system introduces the light flux emitted from the third light source as a finite divergent light flux to be incident on the objective optical element when information is reproduced from or recorded on the third information recording medium (see the description of the beam expander in paragraphs [0197] to [0213]

which is identical to the element applicant uses to convert the light into the finite divergent light flux).

Regarding claim 11, Kimura teaches an optical pickup apparatus wherein the light converging optical system introduces the light flux emitted from the second light source as a finite divergent light flux to be incident on the objective optical element when information is reproduced from or recorded on the second information recording medium (see the description of the beam expander in paragraphs [0197] to [0213] which is identical to the element applicant uses to convert the light into the finite divergent light flux).

Regarding claim 12, Kimura teaches an optical pickup apparatus wherein the finite divergent light flux which is incident on the objective optical element when information is reproduced from or recorded on the second information recording medium has a smaller divergent angle than the finite divergent light flux which is incident on the objective optical element when information is reproduced from or recorded on the third information recording medium (see the description of the beam expander in paragraphs [0197] to [0213] which is identical to the element applicant uses to generate a finite divergent light flux with a smaller divergent angle for the second information recording medium than that of a third information recording medium).

Regarding claim 17, Kimura teaches an optical pickup apparatus, wherein the chromatic aberration correcting element is at least one of a beam expander, a collimator, or a coupling lens (see paragraph [0200] where the chromatic aberration is corrected with a beam expander).

Regarding claim 18, Kimura teaches an optical pickup apparatus, wherein the chromatic aberration correcting element is a beam expander (see paragraph [0200]).

Regarding claim 21, Kimura teaches an optical pickup apparatus wherein the spherical aberration correcting element is at least one of a beam expander, a collimator, or a coupling lens (paragraph [0517]).

Regarding claim 23, Kimura teaches an optical pickup apparatus wherein the spherical aberration correcting element is a beam expander (paragraph [0517]).

Regarding claim 27, Kimura teaches wherein the objective optical element is made of plastic material (see paragraphs [0370], [0408], and [0436]).

Regarding claim 29, Kimura teaches wherein an incidence plane of a light flux emitted from the light sources in the objective optical element is a refracting surface (see Kimura paragraph [0524]).

8. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kaiho et al. (US PGPub Number 2003/0185136 A1) in view of Kimura et al. (US PGPub Number 2002/0012313 A1), as applied to claim 1 above, and further in view of Tsuji et al. (US Patent Number 5,048,000).

Regarding claim 30, Kaiho and Kimura teach the optical pickup apparatus of claim 1, but fail to teach that the objective optical element is made of a glass material. Tsuji, however, teaches a conventional optical information reading apparatus wherein the objective optical element is made of a glass material (see column 4 lines 10-12).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the glass objective lens taught by Tsuji into the optical pickup apparatus of Kaiho and Kimura. One of ordinary skill in the art at the time the invention was made would have been motivated to combine the teachings because it would have been conventional to do so at the time the invention was made as stated by Tsjui (column 4 lines 10-12).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LaTanya Bibbins whose telephone number is (571) 270-1125. The examiner can normally be reached on Monday through Friday 7:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on 571 272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LaTanya Bibbins

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